REMARKS

The Office Action mailed December 17, 2004, and made final, has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-4, 6-7, and 9-12, are now pending in this application. Claims 5, 8, and 13-19 are canceled. Claims 1-19 are rejected.

The rejection of Claims 1-19 under 35 U.S.C. § 112, first paragraph is respectfully traversed. Claims 4, 8, and 13-19 are canceled.

Applicants respectfully submit that Claims 1-3, 5-7, and 9-12 satisfy the requirements of Section 112, first paragraph. More specifically, Applicants respectfully submit that the specification clearly describes the subject matter in the claims with respect to "determining a stiffness multiplier" as recited in the claims. Specifically, the specification recites in part that "[i]nstead of modeling shrouded bellows 12 (shown in Figures 1 and 2) as spring elements including an assigned spring constant that is based on static stiffness component test data, shrouded bellows 12 is characterized using a standard geometry element that includes an assigned stiffness multiplier based on dynamic stiffness component test data. The stiffness multiplier is a finite element input that may be selectively adjusted to customize a dynamic stiffness of a particular shrouded bellows element. The stiffness multiplier is determined 120 with a regression equation that accounts for tube sub-system diameter 37 and 38, system operating pressure, bellows pitch 80, and dynamic system operating inputs. The regression equation is based on dynamic stiffness test data obtained as a result of testing several different shrouded bellows configurations. Each different shrouded bellows configuration can be analytically modeled to determine a unique stiffness multiplier for that specific shrouded bellows configuration and to generate a tube sub-system analytical model.

The specification clearly describes that the stiffness multiplier is determined using a regression equation that is based on dynamic system test data that is obtained as a result of testing several different shrouded bellows configurations. Accordingly, Applicants respectfully submit that the specification contains a written description of the invention, and of the manner and process of making and using it, to enable any person skilled in the art to make and use the same.

For at least the reasons set forth above, Applicants respectfully request that the Section 112 first paragraph rejection of Claims 1-19 be withdrawn.

Claim 6 has been amended. Applicants respectfully submit that Claim 6 particular points out and distinctly claims the subject matter which applicants regard as the invention. Accordingly, for at least the reasons set forth above, Applicants respectfully request that the Section 112 second paragraph rejection of Claim 6 be withdrawn.

Claims 14-19 have been canceled. Applicants therefore respectfully request that the Section 112 second paragraph rejection of Claims 14-19 be withdrawn.

The rejection of Claims 1-19 under 35 U.S.C. § 103 as being unpatentable over Rosemount Inc. (Technical Data Sheet "Pressure Fundamentals and Transmitter Selection" 1998) "Rosemount", in view of Broman, et al. ("Modeling Flexible Bellows by Standard Beam Finite Elements" 1999) is respectfully traversed. Claims 5, 8, and 13-19 are canceled.

Rosemount describes the fundamentals of pressure measurement and also describes factors that should be considered when selecting a pressure transmitter for use inside a pressure transducer. Specifically, Rosemount describes an equation that is useful in identifying the natural frequency response of a flat diaphragm. While Rosemount does state that a bellows assembly may be used to "convert applied pressures into displacement", Rosemount is silent with regards to modeling the bellows assembly. Moreover, Applicants respectfully submit that Rosemount does not describe applying pressure measurement to modeling or simulation of a bellows assembly. Additionally, Applicants respectfully submit that the bellows described by Rosemount is useful to convert applied pressures into displacement, whereas in contrast to Rosemount, Broman et al. describe a bellows in an exhaust system that is modeled based on pressure within the bellows assembly.

Broman, et al. describe a method to model a tube-hose. Notably, Broman et al. do not describe or suggest a method of modeling a shrouded bellows assembly. More specifically, Broman et al. describe a method to predict a theoretical bellows using engineering formulae derived from the theoretical bellows geometry. However, as understood by the Applicants, the method described by Broman et al. is unable to model the effect of metal braid, or a ball joint, since the Broman et al. method is based on engineering formulae derived from the bellows geometry. Accordingly, the method described by Broman et al. does not capture the

affects of fiction, and/or any other affects caused by the outer shroud and the inner liner as recited in the pending claims. Therefore, Broman et al. describe a mathematical formula based on engineering principles to derive a theoretical bellows and does not describe nor suggest determining a stiffness multiplier within each of the shrouded bellows components using a regression technique based on dynamic stiffness test data. Accordingly, Applicants respectfully submit that the engineering principles described by Broman et al. are described with relation to a simple non-shrouded bellows assembly, whereas the model described in the present invention is used to model a shrouded bellows assembly as recited in the claims.

Moreover, Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to modify Rosemount in view of Broman, et al. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Rosemount nor Broman, et al., considered alone or in combination, describes or suggests the claimed combination.

Furthermore, and in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Rosemount with Broman, et al. because there is no motivation to combine the references suggested in the art. Rather, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants' own teaching. Only the conclusory statement that "it would have been advantageous to model real-time events to confront and eliminate safety hazards due to the possibility of underestimating pressure states and natural frequencies values." However, as described previously herein, Broman et al. does not describe modeling "real-time events" as asserted in the Office Action, rather and in contrast to the assertion in the Office Action, Broman et al. model a non-shrouded bellows utilizing a mathematical formula based on engineering principles, not actual dynamic stiffness data obtained from a plurality of shrouded bellows. Moreover, the bellows described "briefly" by Rosemount is designed to convert external pressure into mechanical force, whereas the bellows modeled by Broman et al. is designed to be utilized in an automotive exhaust system.

Therefore, it is respectfully submitted that a prima facie case of obviousness has not been established. As explained by the Federal Circuit, "to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01.

Moreover, the Federal Circuit has determined that:

> [I]t is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, "it is impermissible . . . to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991).

Applicants therefore submit that the present Section 103 rejection is improper, as the rejection is merely based on a combination of teachings selected in an attempt to deprecate the claimed invention. More specifically, Rosemount is merely cited for describing that a bellows assembly can be utilized in a pressure transducer to convert external pressure into mechanical force, and Broman, et al. is cited for describing modeling of flexible car exhaust bellows by utilizing mathematical equations based on standard physics.

Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 1-19 be withdrawn.

Moreover, Claim 1 recites a method for predicting natural frequency responses wherein the method includes "providing at least one tube sub-system including a plurality of shrouded bellows components...determining a stiffness multiplier within each of the shrouded bellows components using a regression technique based on dynamic stiffness test data...using the determined stiffness multiplier in a model that applies a standard geometry element and a flexibility factor based upon the stiffness multiplier to predict a natural frequency response...and determining locations for duct supports based on the natural frequency response."

Neither Rosemount nor Broman et al., alone or in combination describe the method recited in Claim 1. Specifically, Rosemount is silent regarding modeling a bellows assembly, and Broman et al. describe, in contrast to the recited claim, modeling a non-shrouded bellows using using engineering formulae derived from the theoretical bellows geometry. For at least the reasons set forth above, Claim 1 is submitted to be patentable over Rosemount in view of Broman, et al.

Claim 5 is canceled. Claims 2-4 and 6 depend from Claim 1. When the recitations of Claims 2-4 and 6 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-4 and 6 likewise are patentable over Rosemount in view of Broman, et al.

Claim 7 recites a modeling system for determining natural frequency response of shrouded bellows components, said system comprising a processor configured to "determine a stiffness multiplier within the shrouded bellows components using a regression technique based on dynamic stiffness test data...use the determined stiffness multiplier in a model that applies a standard geometry element and a flexibility factor based upon the stiffness multiplier to predict a natural frequency response of the bellows...and determine a location of a duct support based on the natural frequency response."

Neither Rosemount nor Broman et al., alone or in combination describe the modeling system recited in Claim 7. Specifically, Rosemount is silent regarding modeling a bellows assembly, and Broman et al. describe, in contrast to the recited claim, modeling a non-shrouded bellows using engineering formulae derived from the theoretical bellows geometry.

For at least the reasons set forth above, Claim 7 is submitted to be patentable over Rosemount in view of Broman, et al.

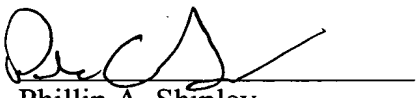
Claims 8 and 13 are canceled. Claims 9-12 depend from Claim 7. When the recitations of Claims 9-12 are considered in combination with the recitations of Claim 7, Applicants submit that dependent Claims 9-12 likewise are patentable over Rosemount in view of Broman, et al.

Claims 14-19 are canceled.

For at least the reasons above, Applicants respectfully request the 103 rejection of Claims 1-19 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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